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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Hygroscopicity of the submicrometer aerosol at the high-alpine site Jungfraujoch, 3580 m a.s.l., Switzerland" *by* S. Sjogren et al.

Anonymous Referee #2

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The paper is well written and is suitable for publication in ACP. The authors present some interesting results and analyses that help understand the hygrosopicity of internally and externally mixed aerosols. I just have some minor comments:

1) One of the important findings that was highlighted in the conclusion is the choice of the two primary components for ZSR in the proton-ammonium-bisulfate-sulfate system. Kim et al. (1989) arrived at the same conclusion when they compared the ZSR predictions with the SCAPE predictions and EDB measurements. 2) What is the relationship between GF* and a volume or mass averaged growth factor? That would help readers relate the analyses of hygroscopic growth and chemical composition measure-

ments. 3) The statistical analysis involves the use of a delta GF of 0.15 as a criterion for differentiating external and internal mixtures after hygroscopic growth. This is reasonable because the GF of the inorganics is sufficiently different from that chosen for the SOA. It may be a point that is worth highlighting. 4) In the paper, the choice of GF=1.2 for organics is based on GF measured for SOA. Without a further elaboration on the chemical compositions and trajectory analysis to reveal the sources and reactions involved of the organics found in the campaign, the choice of GF=1.2 is not as justified as it should be. However, the choice of another GF value would probably not make a difference in the results presented because the overwhelming dominance of the inorganics in GF. 5) From Figure 3, there appears bimodal distributions of GF near the period of 13.3.00 to 15.3.00 too.

Kim Y.P., Pun B.K.-L., Chan C.K., Flagan R.C. and Seinfeld J.H. (1994) Determination of water activity in ammonium sulfate and sulfuric acid mixtures using levitated sing particles. Aerosol Science and Technology, 20:275-284.

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